

Dust Mitigation Vehicle

Paving the Moon to Control Dust

About the Technology

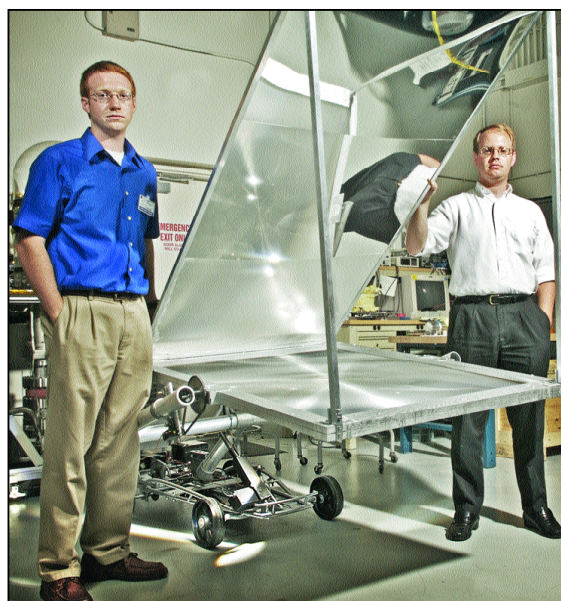
Goddard has been working on techniques to vaporize lunar soil or regolith using nothing more than focused sunlight. This technology has led to a concept for dust mitigation –the Dust Mitigation Vehicle (DMV). Under the concept, a Fresnel lens would be attached to a vehicle. The lens would focus sunlight onto the lunar surface and either melt or sinter the regolith, depending on the type of surface desired.

Significance of the Technology

Dust is one of the most challenging problems facing NASA and the astronauts who will live and work on the Moon. As the Apollo program showed, lunar dust is tenacious. It embeds itself in equipment and onto spacesuits and eventually is tracked into lunar habitats and other spacecraft. One way to prevent the dust from getting into the habitat is to “pave” the area around the base.

Benefits of the Technology: At-A-Glance

- ◆ Weighs less than 50 kg.
- ◆ Requires little to no power.
- ◆ Doubles as a science platform. By heating the regolith, volatiles are released that then can be captured with a cold trap or measured with a mass spectrometer.



This is a prototype of the so-called Dust Mitigation Vehicle, which would help control the lunar dust problem around lunar bases by melting or “paving” the regolith.

Technology Origins

University researchers are developing similar applications using microwave heating. However, this technique requires substantially more power. It also would have to be tethered to a power source or come equipped with large solar panels.

Looking Ahead

While the flat primary and Fresnel lens are very lightweight, Goddard researchers hope to improve the optics so that the system uses only a single lightweight mirror.

Contact:

Eric.H.Cardiff@nasa.gov

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